Executive Summary

Project Description

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This report summarizes the results of a study to investigate strategies to increase recycling in Colorado commercial office buildings. The Colorado Office of Energy Management and Conservation, in partnership with Lighthouse Environmental, conducted the study from January 2000 through April 2001. The purpose of the study was to implement an improved recycling program in an office building, and report all findings affecting recycling, including:

- How to implement a new or renewed recycling program
- Translating waste reduction into bottom line savings
- Outreach and training best practices
- Proven collection and processing equipment, methods and technologies
- Local markets for waste hauling and recycling collection
- How to recycle non-traditional and hazardous materials

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The study took place at downtown Denver's World Trade Center, two 29-story towers with a population of 1,800. Built in the early 1970s, the facility was chosen because it is representative of many multi-tenant commercial office buildings in Colorado.

Over 40% of the waste stream in Colorado comes from commercial buildings. And according to the EPA, 80% of a typical office's waste stream is recyclable, reusable, or can be remanufactured, with 60% of it being white or mixed paper.

Economic, Environmental and Social Benefits

Low waste disposal costs combined with high costs to ship recycled materials long distances to end markets have tended to discourage recycling efforts in Colorado. However, waste reduction through recycling can be an effective cost-saving strategy for office buildings. Commercial property managers can save money by investing in tenant outreach and education, convenient collection containers, and equipment to manage waste more efficiently. Preventing waste also protects against future disposal cost increases.

The social and environmental benefits of recycling are clear. Recycling saves energy and natural resources, reduces pollution and greenhouse gases, and provides employment, while supplying industry with an environmentally preferable source of raw materials. Due to relatively low disposal costs, though, Colorado property managers are less likely to see waste reduction as a priority. In fact, at just under $17,000 per year, World Trade Center trash disposal amounts to only a tiny fraction of its overall budget.

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Where the Savings Come From

Since waste disposal costs are based on the size and type of disposal containers used, and the frequency of pickup, when waste is reduced, disposal costs decrease. However, it is best to reduce collection frequency first, since trucking and labor costs generally make up the majority of disposal costs in Colorado. Properly sorted recycled materials do have value, but, as commodities, their market value will fluctuate. The analysis at the World Trade Center showed that reducing waste collection frequency and volume would have a much greater impact on costs than income from the sale of the recycled materials.

Baseline Study Findings

The project began with a process of negotiating agreement with building managers on the scope of work. The next step was to determine baseline conditions, including amounts and types of materials disposed and recycled, tenant attitudes and practices, recycling and trash systems cost, including the costs of gathering trash and recyclables, and the costs of disposal.

The survey and inspections showed that while only 40 - 50% of tenants had recycling bins at their desk, a full 87% of respondents said that recycling is beneficial.

An initial waste audit showed that approximately 19% of tenant office waste was being recycled, but that another 53% of the materials in the trash could have been recycled or reused. Another 7% was food waste, and the last 21% was non-recyclable trash. The audits did not account for materials placed in the trash during the day by tenants, dock personnel, custodial staff, retail employees, and building engineers. Those items include significant amounts of corrugated cardboard and other packaging materials, furniture, equipment, fluorescent light bulbs, construction and demolition debris, computers, and other items.

Along with visual inspection of tenant recycling activities, a recycling attitude and practices survey was conducted. The survey and inspections showed that while only 40 - 50% of tenants had recycling bins at their desk, a full 87% of respondents said that recycling is beneficial, and 73% said they would be “very willing” to participate in an improved office

recycling program. It was clear that tenants wanted to recycle, but many were not able to participate.

Implementation and Outreach

Once the baseline study was complete, World Trade Canter management gave the go ahead to implement the new program, which involved changing the program in several ways. A new contract with more favorable terms was negotiated, new materials were added to the collections, office collection service was improved, and new durable, more attractive containers were provided to tenants. The new program was kicked off with a concerted education and promotions effort that involved flyers, signage, staffed lunchtime recycling displays, and group and individual trainings.

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It is also critical to reach out to custodial and dock personnel. Support from custodial and dock personnel are key to the success of any office recycling program. As such, they were consulted throughout the study, and were subsequently provided training in program specifics. The dock manager devised and uses a form to ensure proper accounting for the materials collected. As a result of this collaboration, facility staff are more supportive of the program.

The overall training and outreach efforts helped to reduce contamination of materials collected from an average of 30% for the previous three years, to zero for the first five months of the program. The improved quality along with the new pricing agreement tripled income per ton on the sale of recyclables.

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Other Recyclable Materials

Due to the large amount of old corrugated containers (OCC) seen during waste audits, consultants recommended that the World Trade Center purchase a Baler to recycle OCC. An analysis showed a 16-month payback on the purchase, and seven months to positive cash flow on the lease of a baler.

The report also provides advice on how to recycle non-traditional recyclables, including furniture, computers and hazardous wastes.

Conclusions

Overall, the study revealed that there may be considerable room for increasing recycling and reducing solid waste generated in Colorado commercial offices. The study also revealed that, due to the prevalence of home recycling programs, and the arrival of people from parts of the

country where recycling is mandatory, Colorado office workers want to recycle.

Above all, in order to implement recycling, one must emphasize how reducing waste not only benefits the environment, but also improves business efficiency and the bottom line.

Recycling in multi-tenant office buildings presents challenges because of the coordination needed among different stakeholders within the facility. Support from each group of stakeholders is vital to the success of any recycling program.

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Our appreciation to the following:

- *Recycling at Work, Workplace Recycling Guide* – A Clean Texas Publication
- *San Francisco Recycling and Hazardous Waste Guide for commercial property owners and managers* – City of San Francisco
- *US EPA Solid Waste Resources CD ROM & US EPA WasteWise Update Electronics Reuse and Recycling*
- *Recycling Assistance Business Programs* Department of Natural Resources Solid Waste Division, King County Washington
- *Business Guide to Harder to Recycle Materials* – EcoCycle, Boulder, Colorado
- *Commercial Recycling Guide* – Department of Environmental Protection, State of Pennsylvania